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CITY OF NEWARK, NEW JERSEY

DEPARTMENT OF PUBLIC WORKS
ANNUAL REPORT
DIVISION OF WATER
1949

CITY OF NEWARK, NEW JERSEY

DEPARTMENT OF PUBLIC WORKS

A N N U A L R E P O R T

D I V I S I O N O F W A T E R

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CITY OF NEWARK, NEW JERSEY

DEPARTMENT OF PUBLIC WORKS

LEO P. CARLIN

DIRECTOR

DIVISION OF WATER

L. DUDLEY COLES
CHIEF ENGINEER

WILLIAM G. BANKS
DIVISION ENGINEER

March 14, 1950

Mr. L. Dudley Coles, Chief Engineer
Department of Public Works
City Hall Annex
Newark, N. J.

Dear Sir:

The following report of the activities of the Division of Water for the year ending December 31, 1949 is respectfully submitted, and pertains to that portion of the Division of Water under the Department of Public Works, which covers the maintenance and operation of the water supply system, and improvements and betterments.

Included in the report are tables and other statistics showing pertinent information regarding the maintenance and operation of the water supply system, including capital improvements made during the year.

Water consumption for the year 1949 amounted to 30731.6 million gallons, equivalent to a daily average of 84.2 million gallons, which amount does not include water sold to Bayonne by the North Jersey District Water Supply Commission for the account of Newark. The 1949 average daily consumption of 84.2 million gallons is 2.8 million gallons under the daily average consumption for 1948.

The total operating revenue for the year 1949 amounted to $3,532,002.13, and the total operating expense amounted to $2,945,284.46 of which $1,153,056.45 was expended for fixed charges (interest and serial bond payments), resulting in a revenue surplus of $586,717.67.

Expenditures for capital improvements amounted to $303,122.42 and were financed by the issuance of bond anticipation notes authorized by bonding ordinances adopted during the years 1946, 1947 and 1948.

Due to the lack of rainfall and high consumption demands it was necessary to inaugurate conservation measures during the last two months of the year. The rainfall for 1949 amounted to 39.20 inches, which was 10 inches under the average rainfall for a 57 year period.

The total number of employees on the payroll as of January 1, 1949 was 481, which included the entire Division of Water. After the City Commission election in May, 1949 the Division of Water was subdivided into two sections, (1) under the Department of Public Works, covering the maintenance and operation and capital construction of the Division of Water, and (2) under the Department of Revenue and Finance, covering commercial and accounting work of the Division of Water, and resulted in the transfer of 120 employees to the Department of Revenue

and Finance, leaving 361 employees in the section of the Division of Water under the Department of Public Works. During the year, 8 employees were added, and 35 employees were removed from the payroll through deaths, resignations and retirements, making a total decrease of 27, or a total of 334 employees in the maintenance and operation section of the Division of Water, under the Department of Public Works, as of the end of 1949. Twelve (12) employees were carried on the payroll on pension and compensation award at the end of 1949.

Very truly yours,

W. G. Banks.

WGB:L

Division Engineer

A N N U A L R E P O R T

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O R G A N I Z A T I O N

Leo P. Carlin, Director
Gilbert W. Hewson, Deputy Director
Charles P. McCann, Secretary
L. Dudley Coles, Chief Engineer

DIVISION OF WATER

William G. Banks, Division Engineer

General Operation and Planning	- James E. Garratt Designing Engineer
Pequannock Watershed	- Thomas P. Byrnes Superintendent
Safeguarding and Purification	- Julius F. D. Bauermann Chemist
Transmission System	- Louis E. Kroeller Supervisor of Conduit Maintenance
Distribution System	- Frederick G. Scherer Superintendent of Construction and Maintenance

D I V I S I O N O F W A T E R

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C O L L E C T I O N

PRECIPITATION - PEQUANNOCK SUPPLY

The precipitation on the Pequannock Watershed as determined from the average of observations at three locations, Canistear, Oak Ridge and Charlotteburg, amounted to 39.20 inches for the year 1949. This is considerably below the average, which for the years of record since 1893 is 49.10 inches.

The month of greatest rainfall was January with 6.13 inches, and the month of least rainfall June with 0.61 inches. Below normal rainfall occurred also for the months of February, March, July, August, October, November and December.

STORAGE AND DEPLETION - PEQUANNOCK SUPPLY

At the beginning of the year all Pequannock Reservoirs were drawn down. The total amount of water in storage was 6659 million gallons, including Cedar Grove Reservoir. Canistear Reservoir was depleted by 1532 million gallons, Clinton Reservoir by 1302 million gallons, Oak Ridge Reservoir by 2485 million gallons, Echo Lake Reservoir by 152 million gallons, and Cedar Grove Reservoir by 46 million gallons. Total depletion was 5517 million gallons.

As a result of heavy rains on December 30 and 31, 1948, storage rose very rapidly and by the end of January had reached 11,000 million gallons. Thereafter the rise continued slowly until by May 1, [illegible] reservoirs were full. They remained full until early in June. From then, because of deficient rainfall, storage declined without interruption until December 12th, when storage reached 3984 million gallons, the lowest for the year. Storage remained practically at this level until December 26th and then started to rise. As of December 31st storage totaled 4256 million gallons, depletion being 7920 million gallons.

WATER DIVERSION - PEQUANNOCK AND WANAQUE SUPPLIES

A total of 30,575.5 million gallons was diverted from the Pequannock and the Wanaque Watersheds, for the use of Newark and its customers, during 1949, as compared with 31,805.0 million gallons in 1948, a decrease of 1229.5 million gallons.

A total of 18942.5 million gallons of water was diverted from the Pequannock Watershed during 1949, as compared with 19,707.2 million gallons in 1948, a decrease of 764.7 million gallons.

From Wanaque Reservoir, 11,633.0 million gallons of water were taken by Newark in 1949, as compared with 12,097.8 million gallons in 1948,

a decrease of 464.8 million gallons.

Month by month figures of the amount of the 1949 diversions are shown in the last columns of Table II of this report.

The Pequannock diversion figures differ from the figures of consumption of Pequannock water by the amount of the gain or loss in storage in Cedar Grove Reservoir. The total consumption of Pequannock water, as seen in the next paragraph, is more than the Pequannock diversion by 156.1 million gallons, which represents the net loss in Cedar Grove Reservoir storage during the year 1949.

WATER CONSUMPTION - PEQUANNOCK AND WANAQUE SUPPLIES

The total consumption of water in the Newark System for the year 1949 was 30,731.6 million gallons (an average of 84.2 million gallons daily), a decrease of 1098.5 million gallons (2.8 million gallons daily) over the 1948 figure of 31,830.1 million gallons (87.0 million gallons daily).

Of the total consumption, 19,098.6 million gallons (52.3 million gallons daily) were from the Pequannock supply, and 11,633.0 million gallons (31.9 million gallons daily) from the Wanaque supply, as compared with 19,732.3 million gallons (53.9 million gallons daily) from the Pequannock in 1948, and 12,097.8 million gallons (33.1 million gallons daily) from the Wanaque in 1948.

During the first half of January and from late May to mid October, Pequannock water at the rate of about 10 million gallons daily was introduced into the Belleville -Wanaque Level, as has been the practice during parts of the previous years. It is estimated that the total amount was about 530 million gallons in 1949.

The use of Pequannock water through Belleville Reservoir was discontinued on July 18, 1949, when the reservoir was placed out of service for cleaning. Use of Pequannock water through Belleville Reservoir was resumed on September 23, 1949.

Of the total 1949 consumption of 30,731.6 million gallons, 24,685.1 million gallons (67.6 million gallons daily) were consumed in Newark, and 6046.1 million gallons (16.6 million gallons daily) were delivered to other systems. For details see Tables Nos. I and II of this report.

The consumption of water in the Newark System during the month of June, 1949, which was very hot and dry, equalled the all time high monthly mean of 95.2 million gallons daily which occurred in September, 1948.

As a result of water conservation program in the late fall of 1949, the monthly mean consumption for December was reduced to 70.1 million gallons daily as compared with 85.3 million gallons daily for December, 1948.

TABLE I

CONSUMPTION STATEMENT YEAR ENDING DECEMBER 31, 1949

1949	Total consumption per month, million gallons, Newark, Belleville, Bloomfield, Elizabeth, Wayne, Packanack, Elizabethtown Water Co., Essex Co. Hosp. (Verona), Pequannock Township and Commonwealth Water Co.	Average daily consumption, million gallons, Newark and Suburbs.	Total consumption per month, million gallons, Suburbs.	Average daily consumption, million gallons, Suburbs.	Total consumption per month, million gallons, Newark.	Average daily consumption, million gallons, Newark.	Average temperatures, Newark.	Rainfall - inches, Newark.
Jan.	2555.2	82.4	573.5	18.5	1981.7	63.7	38	6.33
Feb.	2313.1	82.6	520.6	18.6	1792.5	64.0	38	3.69
Mar.	2571.2	82.9	490.7	15.8	2080.5	67.1	43	1.95
Apr.	2453.7	81.8	423.2	14.1	2030.5	67.7	53	4.13
May	2610.9	84.2	390.4	12.6	2220.5	71.6	62	4.01
June	2854.6	95.2	560.3	18.7	2294.3	76.5	74	0.07
July	2658.6	85.8	526.6	17.0	2132.0	68.8	80	2.95
Aug.	2903.5	93.7	556.7	17.9	2346.8	75.8	76	2.66
Sept.	2651.1	88.4	495.1	16.5	2156.0	71.9	65	3.06
Oct.	2575.6	83.1	530.3	17.1	2045.3	66.0	62	1.59
Nov.	2410.4	80.3	552.3	18.4	1858.1	61.9	44	1.15
Dec.	2173.7	70.1	426.4	13.7	1747.3	56.4	38	2.47
Totals:	30731.6		6046.1		24685.5			34.06
Average		84.2		16.6		67.6		

Estimated population of Newark by Board of Health 440,000

Estimated population of other Municipalities served 140,000

TABLE II

QUANTITIES OF WATER DELIVERED TO OTHER SYSTEMS

1949	Belleville	Bloomfield	Elizabeth	Elizabethtown Water Co.	Packanack	Essex County Hospital Verona	Wayne	Pequannock Township	Commonwealth Water Co.	East Orange	Totals	Received from Wanaque (at Belleville)	Quantities consumed from Pequannock Watershed	Quantities diverted from Pequannock Watershed
Jan.	75.7	137.7	261.1	1.7	5.8	5.0	2.2	1.8	82.5	-	573.1	922.9	1632.3	1630.5
Feb.	66.8	125.2	236.4	1.5	4.7	3.2	1.2	1.6	80.0	-	520.6	977.6	1335.5	1331.9
Mar.	75.4	139.5	208.6	1.6	5.2	2.8	1.7	1.8	54.1	-	490.7	1070.8	1500.4	1522.2
Apr.	77.6	144.0	188.1	1.6	5.1	1.3	2.1	1.2	2.2	-	423.2	987.3	1466.4	1447.3
May	73.9	130.5	171.1	1.4	5.2	3.9	2.0	2.4	-	-	390.4	1037.0	1573.9	1562.8
June	98.7	171.1	219.4	1.8	11.1	7.6	2.1	2.9	45.6	-	560.3	968.0	1886.6	1914.2
July	91.4	161.8	203.2	1.6	9.2	6.7	2.2	2.4	45.5	2.6	526.6	990.8	1667.8	1642.6
Aug.	89.4	167.5	220.1	1.4	10.6	6.8	2.6	3.2	52.1	3.0	556.7	1158.6	1744.9	1767.6
Sept.	72.8	150.6	210.0	1.6	6.6	4.2	2.1	1.2	46.0	-	495.1	938.2	1712.9	1512.7
Oct.	72.2	143.7	234.5	1.7	7.1	4.6	7.7	2.5	56.3	-	530.3	851.5	1724.1	1604.0
Nov.	73.6	135.6	237.2	1.6	6.6	4.5	19.0	2.5	71.7	-	552.3	935.2	1475.2	1396.7
Dec.	47.8	110.1	187.1	1.5	6.4	4.1	1.8	2.2	65.4	-	426.4	795.1	1378.6	1610.0
Totals:	915.3	1717.3	2576.8	19.0	83.6	54.7	46.7	25.7	601.4	5.6	6046.1	11633.0	19098.6	18942.5

PEQUANNOCK WATERSHED

SANITATION

The population of the watershed increased from 1700 to 1877 persons. New developments in the area included those of Paul Wohele, John Chardavoyne, the Newfoundland Fire Company, and the Summit Lake development by the Crane Company.

Garbage and refuse was collected from homes and business places and disposed of at the new incinerator. Thirty seven (37) new cesspools were installed by the watershed crew. They also installed seven (7) septic tanks.

All properties were inspected during the spring and fall by the Sanitary Inspector.

A "clean up" week was held in June, with all residents being notified by card to gather up refuse accumulations that they ordinarily overlook. Extra collections by our trucks were necessary to handle the increased loadage.

INSPECTION - GUARDS

The guard force consisted of 6 men with 2 cars, supplemented by additional men during the deer season and Christmas holidays to guard spruce plantations. All streams were walked during the fall and winter. The following statistics are taken from the Guards' report for the year: Total mileage on both cars was 55,774; one violator was taken to court and fined; 55 deer, 48 dogs, 2 calves, 2 foxes, and some 50 smaller animals were picked up and disposed of; 500 "No Trespassing" signs were put up throughout the area; 34 firewood permits were checked; and 17 bough and green permits were checked. All rubbish and papers along roads and highways were picked up by the Guards. Reservoir boats were cared for, and all fishing permits were checked.

RESERVOIRS - DAMS - STREAMS

Dams and approaches were mowed frequently with tractor and crew. Grass and weeds were also mowed along all mains streams and rivers. During the summer weeds were raked from the Pequannock River, Charlotteburg Pond and the Macopin Intake.

The gates at Hank's Pond, Orean Park and Echo Lake were repaired.

DROUGHT CONDITIONS

Water in storage on the watershed reached its lowest point in years. This was due primarily to lack of rainfall. The average rainfall on the watershed amounts to 48 inches per year. In 1949 we had just over 40 inches.

To alleviate this condition steps were taken to make additional water available from Echo Lake Reservoir. Soundings were taken and plans were discussed for opening a channel from the west gate house to the deeper section of the reservoir.

INSECTS AND DISEASE

Two infections of white pine blister rust were found during the fall and appropriate measures to eliminate these will be taken at the proper time. The disease cannot spread from pine to pine but travels from pine to currant or gooseberry and thence back to pine. Hence, wild currant plants in the vicinity must be pulled.

Other diseases and insect infections were normal in extent and regular methods of control were practiced.

PROPERTY LINES

Several boundary lines were re-blazed or re-painted, or both. There was a considerable amount of checking of our properties because of new buildings being constructed on adjacent land.

FIRES

Thirteen acres were burned over by ten fires, ten of forest and three of grass and cover. Acreage burned over was less than four tenths of one per cent.

PLANTING

Twelve thousand six hundred and fifty trees (12,650) were planted in the Oak Ridge section, as follows:

6,000 Norway Spruce	3 yr. seedlings	State purchase
1,000 Douglas Fir	3 yr. seedlings	State purchase
5,000 White Pine	3 yr. seedlings	State purchase
650 White Pine	3 yr. seedlings	Supplied free by CSC (Fed.)

THINNING AND PRUNING

Two acres of Red Pine, about eighteen years of age, were pruned by our men. Four acres of old Scotch Pine were also pruned. About five additional acres of pine and spruce were pruned to varying heights by purchasers of Christmas boughs.

TYPE MAPPING

The forest type map of Vernon Township, begun in 1948, was completed, and another covering part of the watershed land in West Milford Township was begun.

FOREST INCOME

Forest income for the year was as follows:

Timber stumpage -	$1,107.44
Laurel and boughs-	262.66
Spruce trees (3) -	101.00
	$1,471.10

MOTOR EQUIPMENT

Three new pieces of motor equipment were received at the watershed. These included two trucks to replace vehicles turned over to the City Garage for disposal, and a Minneapolis Moline tractor with mowing attachments.

All repairs to motor equipment were done at the watershed garage. In addition to the watershed equipment, numerous repairs were made on equipment from Little Falls.

Gas and oil consumption were kept to a minimum.

PERSONNEL

Four employees were lost - two, Charles Hladik and John Houck resigned, and Charles Sisco and Charles Gray died. James Gilroy returned from leave of absence. William Oldham was hired as of December 23, 1949.

SAFEGUARDING AND PURIFICATION

CEDAR GROVE LABORATORY

e procedure of the American Public Health Association and the United ates Public Health Service Drinking Water Standards approved cember 3, 1942 by the Federal Security Agency, supplemented by thods we find better adapted to our own supply, were followed in e Laboratory. The latter methods serve the purpose of checking the rmer. The following samples from the various sources were examined ring the year:

URCE	BACTERIO-LOGICAL	MICRO-SCOPICAL	PHYSICAL
. 1 and No. 2 Lines at Great Notch	598	598	598
dar Grove Res. before treatment	287	-	-
dar Grove Res. after treatment	300	300	300
lleville Reservoir Influent	237	-	-
lleville Reservoir Effluent	249	205	243
naque at Belleville	295	251	295
uth Orange Ave. Reservoir Influent	247	-	-
uth Orange Ave. Reservoir Effluent	248	248	248
ty tap samples	222	183	220
w pipe line samples	80	-	-
copin Intake	52	52	52
ho Lake Brook at Route 23	52	52	52
nouse Brook at Route 23	52	52	52
inton Brook at Junction	52	53	53
k Ridge Brook at Junction	50	50	50
dar Grove Reservoir proper	-	17	4
mplaints	21	50	49
scellaneous	21	-	-
nistear Reservoir	-	2	2
nks Pond	-	1	1
mapo River at Pompton Lakes Dam	4	1	1
ecial	-	6	6
TAL	3067	2121	2226

ADDITIONAL ANALYSES

addition to 1521 free-chlorine residuals and 1902 Hydrogen-Ion lues of delivered waters, and 260 Hydrogen-Ion values of raw water d 58 of miscellaneous waters, made in the Laboratory during the year, e following special work was done by the Laboratory force:

mplete monthly samples of delivered Pequannock water analyzed.... 12
mplaints of taste, odor and dirty water investigated..... 48
conditioned or new lines supervised during sterilization..... 10
mples of leakage into premises examined chemically and
croscopically to determine whether or not the leakage
s from the City mains..... 12
amined chemically, 1 of each boiler compound and boiler residue.. 2
ll sample from around a pipe, examined chemically..... 2

rther checks for residuals and Hydrogen-Ion values were made at the copin Intake Treatment Plant, and for residuals only at the Valley ad, Belleville and South Orange Avenue Reservoir Treatment Plants

hile they were in operation.

MICROSCOPY

ue to microscopical growths and other factors, the following streams nd reservoirs were treated as specified to improve the aesthetic uality of the water:

. The presence of red worms, on March 25th, on Nye Avenue was eported. However, the source of these worms was not determined.

. A complaint of branchipus on Broadway near Chester Avenue was also eported.

. On May 3rd and 4th both Pequannock lines at Macopin were shut down or a short period to remove an accumulated amount of organic matter n which were buried larvae from crayfish, branchipus and various orms of worms. This organic matter extended from the Intake to the hlorine Treatment Plant. This section, after cleaning, was hlorinated.

. Anacharis weed growth at Macopin Intake increased to such an xtent by June 13th that removal was recommended. This took place rom June 20th until July 22nd. From July 19th to 22nd, 400 pounds .C.H. chlorine powder was used to kill off the weed in the shallow reas.

. Anacharis weed growths were also removed from Charlotteburg Pond rom June 21st to July 22nd. Many complaints of the water tasting usty were received during the period of weed removal.

. Aphanizomenon increased considerably by July 11th in Echo Lake eservoir and the water was not used from this reservoir for a period o allow the aphanizomenon to dissipate.

. Sponge growths along the shore of Cedar Grove Reservoir around the eginning of July gave off odors. On July 12th copper sulphate was laced along the shore to control them, the reservoir remaining in ervice.

. On July 18th a profuse growth of snails in Belleville Reservoir ecessitated that the reservoir be by-passed. This was done and the eservoir was cleaned out.

. Due to the presence of dinobryon in Cedar Grove Reservoir it was y-passed on August 17th, treated with copper sulphate on August 19th, nd placed in service on August 26th.

. Oak Ridge Reservoir was treated with copper sulphate on ctober 11th due to the presence of aphanizomenon.

. Due to the reservoirs being very low because of the long drought, he supply has been plagued by the higher forms of animal life. hong these was the small silver shiner, a bait fish. Large quantities f them were found on the screens at the Intake and had to be removed rom October 20th to 26th.

BACTERIOLOGY

aily bacteriological tests were made of all waters entering and eaving the distributing reservoirs.

eekly tests were made on the raw waters of the various streams in the atershed and in various parts of the City to note the quality of the elivered water.

n May 17th samples taken from a main at Port Newark showed consider- ble gas formers. Investigation showed this line to have a dead end. t was flushed out and circulation increased by gate changes elimina- ing this difficulty.

t became necessary to shut down Belleville Reservoir July 18th ecause of decomposing snails that had been treated with chlorine and he presence of tubercles in the reservoir proper that increased the acteria.

complaint from the City Board of Health of the presence of coliform acteria found in a firehouse water tap was checked, but found free f coliform bacteria. Wanaque supplies this area. Checked August rd.

n August 15th, following accusations that the City water supplied a ertain section of the Weequahic part of Newark was unfit to drink, a umber of tests were made. Results showed at time of sampling that he water met the standards of the United States Public Health Service nd the New Jersey State Department of Health. The complainant lives short distance from a regulator, which at times might cause a light physical disturbance.

ollowing receipt of a call from the New Jersey State Department of ealth that a sample of water taken by the Health Officer of Hillside, rom a home which is supplied by the City of Newark, showed coliform acteria in 5 out of 5 gas tubes planted, numerous samples were taken n November 1st and 2nd from all around the locality in question and ot one tube that gave fermentation was found. Results were trans- itted to the State Department of Health. On December 7th sample ans were received from the State Department of Health for samples to e sent to them from this locality. This was done, and, likewise, heck samples in our own containers were taken. Both results were atisfactory. All the streets in this section are dead ends and nless flushing is done periodically occasional gas formers will be ound.

he Board of Health of the Town of Bloomfield, on December 5th, omplained of illness at a home on Ketner Street, and of their find- ng coliform bacteria. Samples from around this vicinity, on the th, showed a residual of 0.10 p.p.m. Cl_2 on the street supplying the ome in question and no gas formers at all.

hlorine demand remained normal again for delivery of safe bacterio- ogically clean water throughout the year. However, higher residuals ere carried to satisfy the request of the State Department of Health.

CHEMISTRY

omplete monthly chemical analyses were made of the delivered water rom Pequannock during the year.

ome 48 complaints of taste, odor and dirty water were investigated uring the year, more than double the 1948 number. Contributing actors to the increase were the heavy drain on our reservoirs, the ack of rainfall, physical disturbances caused by the many gate hanges made in order to do repairs and keep up pressures, and hemical changes due to the mixing of Wanaque and Pequannock waters.

ater taken from a pit at a chemical concern, in March, showed the resence of creosote and acids adjacent to our water meter. The azard was eliminated.

number of complaints from a medical concern on Edison Place were eported. Samples of water were obtained a number of times in this ocality. Trouble was a local condition. Water was supplied from anaque.

n February, a report that a taxidermist was allowing certain chem- cals to enter a stream in the watershed proved to be unfounded upon nvestigation.

artial chemical analyses were made of samples of water submitted to he Laboratory to note if these leakage samples were from City mains. ome 12 of them were tested.

n June 13th a sample of joint compound was tested in conjunction with he many complaints from one party in the Weequahic Housing Project.

n September, 3 samples of soil from a tennis court were tested to ote whether the soil would affect our distribution lines.

PURIFICATION - SANITATION

hlorine residual tests were made hourly of the treated waters at the acopin Intake and Valley Road Treatment Plants, while at Belleville nd South Orange Avenue Reservoir Treatment Plants tests were made very two hours. The Laboratory further checked these residuals aily. At the Macopin Intake Plant, daily Hydrogen-Ion values and lkalinity of the raw water were determined.

acopin Intake Plant: Chloramine treatment was maintained as formerly hroughout the year, except for interruptions and modifications neces- itated for the most part by operations of Pequannock aqueducts for econditioning, testing and minor repairs.

he high capacity chlorine machines from Valley Road Treatment Plant hat were overhauled were placed in operation at our Macopin Intake reatment Plant on April 4th on both lines. So far they have proved o function satisfactorily, giving us plenty of chlorine leeway at eak demands.

o. 1 aqueduct was shut down at the Intake from March 21st to 24th or inspection, and April 1st to make room and necessary tap changes or the new machine. No. 2 aqueduct was shut down April 1st for a hort period to make taps for the new machines.

oth aqueducts, and subsequently both treatment machines were shut own for brief periods on April 11th for inspection of the concrete inings. At this time a large accumulation of organic matter, oupled with small crayfish and larvae of various sorts were seen rom the Intake to the Treatment Plant. On May 3rd No. 1 Line and on

y 4th No. 2 Line were closed down to clean out the organic matter
d crayfish. C.C.H. chlorine powder was added after the cleaning.

wer failure twice on July 17th, at the Macopin Intake Treatment
ant necessitated the use of the auxiliary gasoline driven pump.

July 21st, following weed removal at Macopin Intake, some 400
unds of C.C.H. powder was added to the Intake. Changes had to be
de at the treatment plant to compensate for the extra chlorine.

. 1 Line was down from September 13th, 10:00 A.M., until September
th, 9:00 A.M.

perometric chlorine residual recorders were placed in operation at
e Macopin Intake Treatment Plant, giving 24 hour constant chlorine
siduals on charts on both lines. They assist in showing the
lorine demand variations due to runoffs and in making compensation
r the change. They have operated satisfactorily thus far.

November 7th, 10:00 A.M., No. 1 Line was shut down for the instal-
tion of a new Venturi throat. It was again placed in service on
vember 15th, 2:00 P.M.

lley Road Treatment Plant: This plant operated during the year,
ing chlorine only as the treatment agent. Adjustment of treatment
ok place while Cedar Grove Reservoir was by-passed for copper
eatment from August 17th to August 26th.

wer was off for a time on June 26th at this plant.

ile Cedar Grove Reservoir was lowered for gate and well repairs, and
r cone valve installation in Bloomfield, also during the recondition-
g of the 60-inch line to Newark, the plant remained in operation.

uth Orange Avenue Reservoir Treatment Plant: This plant resumed
eration on May 9th and continued the whole year using straight
lorine, exception being October 24th when it was shut down from
30 P.M. to 9:30 P.M. due to a line break. In the past, use of the
lorine Plant has been discontinued during the winter months.
wever, the State Department of Health, on May 12th, requested the
ntinuation of treatment throughout the year at this plant. On
ly 12th, the State Department of Health further requested that a
sidual of from 0.10 p.p.m. to 0.20 p.p.m., at our outlet taps, be
intained. This has been done, although at times there is a chlori-
us taste to the water leaving the reservoir.

lleville Reservoir Treatment Plant: This plant was placed in opera-
on on May 9th using straight chlorine. On July 13th, due to bacter-
l quality of the water, use of ammonia with the chlorine was started.
creased use of chlorine and ammonia, with no improvement in quality,
de it necessary to by-pass the reservoir on July 18th. The reser-
ir was allowed to stand in case of emergency. Tests were made at
tervals. On August 12th, 380 pounds of C.C.H. chlorine powder was
ed around the reservoir to destroy snails that had become abundant
the reservoir from a source unknown. It was decided to clean out
e reservoir and the process of emptying it was commenced on
gust 22nd, and the cleaning completed by September 21st. At that
me it was chlorinated and tested, then placed in service. Treatment
th ammonia and chlorine continued for the balance of the year,

xcepting for a few days at the end of December when the ammonia was hut down due to gate repairs, and for a few hours on November 28th hen the chlorine was shut down due to a split line. The chlorine achine used at this reservoir was replaced on May 14th, when a new . & T. MMSVA-420 machine was installed. At times during the early ummer there was very little flow of water from this reservoir. This as largely the cause of its poor condition.

WANAQUE SUPPLY

aily microscopical, physical, bacteriological and chlorine reaction ests were made of the Wanaque supply at the Belleville Reservoir ake-off, as heretofore.

t different times during the year, various amounts of Pequannock and anaque waters were used as mixtures in the Belleville-Wanaque Level.

omplaints due to dirty water, odor and bacterial condition of the anaque supply were more than usual this past year. This could be due o long periods of no rainfall, coupled with increased demand. On ovember 19th the pumps at Wanaque were placed in service for the first ime due to low reservoir level and heavy draft. The use of the pumps aused further dirty water complaints from areas in Newark and lizabeth supplied by Wanaque.

MISCELLANEOUS

eriodical inspections of the Pequannock Watershed and the various istributing reservoirs were made, as heretofore, by Laboratory ersonnel.

n order to obtain more water, gates on Cedar Pond, Oreon Park and nks Pond were opened in November. In December, a gate at the flume t Echo Lake Reservoir was opened in order to obtain water from this eservoir, in addition to our regular gate by the dam.

mples were taken from the Ramapo River at Pompton Lakes Dam, during ovember and December, to see if this water could be used in the naque supply.

he Amperometric Chlorine Residual Recorders installed at Macopin ve twenty-four hour charts. Some 3000 tests are automatically corded for each line, where in the past only 24 were made. Chlorine sidual recorders at the outlets to Belleville and South Orange enue Treatment Plants have been advised by the State Board of alth, in that we only take 12 tests at these locations and the sts, at times, are questionable. Wanaque, it is understood, is stalling one at their Belleville location also.

me thought was given to the use of an evaporator at our Macopin take Treatment Plant to assist in eliminating extra tanks. Here ur chlorine tanks are connected to chlorinators, which is more or ss a hazard due to the location of plant by a curve next to the ghway.

TRANSMISSION SYSTEM

he Transmission System comprises all the major aqueducts between acopin Intake and the Distribution System. These are listed as ollows:

0"	Cast Iron. Cedar Grove Reservoir Supply Line.....	3,360 ft.
' x 7'	Concrete Tunnel. Cedar Grove Reservoir.....	3,000 "
0"	Steel. Great Notch to Cedar Grove Reservoir, Cedar Grove Reservoir to Bloomfield Avenue Tower, Belleville Reservoir to Elizabeth, Alexander Avenue Connection (Montclair and Bloomfield)	87,792 "
8"	Steel. Macopin Intake to Second River.....	145,509 "
8"	Steel. Second River to South Orange Avenue Reservoir.....	5,613 "
8"	Reinforced Concrete Pressure Pipe. Second River to South Orange Avenue Reservoir.....	13,208 "
2"	Steel. Pompton Notch to Belleville Reservoir.....	82,192 "
2"	Steel. Second River Crossing and Heller Parkway to Davenport Avenue.....	2,705 "
6"	Steel. Belleville to South Orange Avenue Reservoir.....	20,549 "
	Total.....	363,928 "
	Equivalent.....	68.92 miles
"	Transite Pipe. Macopin Test House to New City Storage Reservoir.....	2,000 ft.

o insure the proper functioning of these lines a maintenance and epair force is stationed at Little Falls Maintenance Yard. The ersonnel consists of 29 employees, classified as follows: 1 Supervisor of Conduit Maintenance, 1 Supervising Repairman, 1 Foreman, Timekeeper and Investigator, 1 Repairman, 2 Utility Welders and 2 Laborers. The entire force is working a 40 hour week. One (1) an was pensioned during the year.

he nature of the work done was as follows:

. Operation of valves as required to effect shut-offs or changes in the method of delivering water to Newark and suburban municipalities.
. Unloading and delivery of chlorine containers.
. Maintenance and repair of equipment.
. Maintenance of right-of-way, cutting brush, mowing grass, and other related work.
. Repairing leaks in pipe lines.
. Overhauling and reconditioning valves.
. Patrolling the pipe lines.
. Reading meters and servicing pressure regulators and cone valves.
. Supervision and inspection of construction performed by contractors on transmission lines.
O. Miscellaneous work.

OPERATION OF PIPE LINES

ollowing is a detailed complete schedule of operations of the equannock Transmission Mains during the year 1949.

an. 19th - Isolated the 60-inch Montclair line, by closing interconnections at Bloomfield Avenue Tower, preparatory to shutting down line for Contract 88.

an. 20th - Removed from service the 60-inch steel Montclair line from Tony's Brook, Bloomfield, to Bloomfield Avenue and North 7th Street, for Contract 88. Closed the Bloomfield connection at Grove Street.

an. 25th - Removed from service the 48-inch steel line from North 7th Street and Bloomfield Avenue to Tower, for Contract 88.

eb. 5th - Restored to service the 48-inch steel line from Bloomfield Avenue and North 7th Street to Tower.

eb. 16th - Removed from service the 48-inch steel line from Bloomfield Avenue and North 7th Street to Tower for repairs to cone valve (Dresser coupling).

eb. 17th - Restored to service the 48-inch steel line from Bloomfield Avenue and North 7th Street to Tower after repairs had been made.

ar. 7th - Restored to service the 60-inch steel Montclair line from Tony's Brook, Bloomfield, to Bloomfield Avenue and North 7th Street, at completion of cement lining, Contract 88. Closed Bloomfield connection at Bloomfield Center and opened the Bloomfield connection at Grove Street.

ar. 7th - Removed from service the 60-inch steel Montclair line from Grove Street, Montclair, to Tony's Brook for Contract 88.

ar. 21st - Removed from service the No. 1 Pequannock line, from Macopin to Great Notch Crossovers, for inspection of cement lining - Contracts 63 and 70.

ar. 24th - Restored to service the No. 1 Pequannock line, from Macopin to Great Notch Crossovers, after inspection was completed.

ay 11th - Restored to service the 60-inch steel Montclair line from Grove Street, Montclair to Bloomfield Avenue Tower. Bloomfield connection at Bloomfield Center opened.

ay 17th - Restored to service the various interconnections at Tower upon completion of Contract 88.

uly 7th - Opened Pequannock Township connection on the No. 1 line at Hopper Avenue. (Request of Mr. Edwards, Superintendent of Water, Pequannock Township).

ug. 17th - By-passed Cedar Grove Reservoir, by operating valves in West Gate House, for copper sulphate treatment.

ug. 26th - Cedar Grove Reservoir was restored to service after copper sulphate treatment.

ept. 13th - No. 1 line shut down at Macopin at 10:00 A.M.

ept. 16th - No. 1 line opened up again at Macopin at 9:00 A.M.

ov. 7th - Removed from service the No. 1 line, from Macopin to Pompton Notch Crossovers, for Contract 95. P.N. valves Nos. 2, 3, 4, 5, 7, 8 opened.

ov. 15th - Restored to service the No. 1 line, from Macopin to Pompton Notch Crossovers, at completion of Venturi installation at Macopin. P.N. valves Nos. 3, 4, 7, 8 closed.

ec. 6th - Removed from service the No. 2 line, from Golf Course, Clifton, to Belleville Reservoir, transferring the Belleville and Bloomfield connections to the No. 1 line for Contract 95.

ec. 12th - Restored to service the No. 2 line, from Golf Course, Clifton, to Belleville Reservoir, transferring the Belleville and Bloomfield connections to same.

ec. 13th - Removed from service, for Contract 95, the No. 1 line from Golf Course, Clifton, to Belleville Reservoir.

ec. 22nd - Restored to service the No. 1 line from Golf Course, Clifton, to Belleville Reservoir.

UNLOADING AND DELIVERING OF CHLORINE CONTAINERS

total of 12 carloads of chlorine were unloaded at Charlotteburg uring 1949. Each carload consisted of 15 one-ton cylinders of hlorine. Unloading was done by a hired crane. Necessary trucks to art containers to storage point were furnished by the City. Each ruck was equipped with a gas mask, canister type, to be used in the vent of emergency while handling chlorine containers.

total of 34 one-ton containers were carted to the Valley Road Treat- ent Plant from the chlorine storage point in Charlotteburg.

ll fire fighting equipment at treatment plants was checked during the ear periodically. Literature containing information on the precau- ions required in the handling of chlorine was distributed to the perators assigned to the Macopin Treatment Plant.

MAINTENANCE AND REPAIR OF EQUIPMENT

new 1949, one-ton Dodge Station Wagon was delivered, replacing the 941 Chevrolet Station Wagon.

ll trucks and cars were greased, and oil changed at regular intervals nd recorded. Minor repairs were made at Little Falls Yard. All ajor repairs were made at Charlotteburg. This procedure is far more

xpedient and efficient than sending equipment to the Bureau of Motors
n Newark.

ll motorized equipment, such as pumps, generators, etc., was checked
fter being in service, then reconditioned for further use. Records
re kept of hours in service, location of job and date.

omplete records are kept for all vehicles as to date and mileage,
hen vehicles are greased, oil changed, State inspection and repairs.

MAINTENANCE OF PIPE LINE RIGHT OF WAY

he right of way from Macopin Intake to Belleville Reservoir was mowed
y City forces, using a Fordson tractor where terrain permitted.

itches in the vicinity of Ryerson's swamp, Pequannock swamp and Smith
ills, together with various small ditches, were cleaned of all debris
uring the year.

any loads of fill were hauled and deposited to several points along
he right of way where rain, etc. caused washouts.

n order to maintain the right of way width, much trimming and cutting
f brush was required.

REPAIRING LEAKS IN PIPE LINE

uring the year 18 leaks in the various transmission lines were
epaired. In addition, during the period that the 60-inch Montclair
ine was unwatered for Contract 88, 10 perforations were closed with
crew plugs and 6 closed by welding patches on them.

ine (9) of the 18 leaks were on the Pequannock No. 2 line between
road Street, Clifton, and Belleville Reservoir. In connection with
heir repair, many (100 plus or minus) near perforations were filled
n by welding, and several larger and deeper near perforations were
losed by welding patches over them.

leak of more important nature was on the No. 2 line, under the
acopin Treatment Plant. This leak was caused by exterior corrosion,
equiring an 8" x 6" patch welded to top portion of line.

n the No. 1 line at Joralemon Street, Belleville, at valve B-11 a
lown gasket, at valve B-131 a split saddle, and at valve B-12 a split
addle (3 leaks in above count) were uncovered when excavation was
ade for a leak at this location. Temporary repairs were made at time
f excavation. When No. 1 line was removed from service in mid
ecember, B-8, 9, 11, 12 were discontinued by welding a blank plate on
he flange of each of the above, from within the pipe, and removing
treet boxes of same.

OVERHAULING AND RECONDITIONING VALVES

Dresser coupling was installed on the 24-inch cone valve at Bloom-
ield Avenue and North 7th Street. It was necessary to cut and re-
hape the coupling to conform to the circumference of the increaser
ube at the point of installation.

ll air valves, Nos. 2 to 10 inclusive, on the 60-inch Montclair line

re dismantled and overhauled while the line was unwatered for the ecution of Contract 88.

the No. 1 Pequannock line, air valve No. 45 was repaired.

the No. 2 Pequannock, air valves Nos. 12 and 17 were repaired.

ow-offs Nos. 3 to 10 inclusive on the 60-inch Montclair line were erated, and necessary repairs made while the line was unwatered for e execution of Contract 88.

new style (Newark Standard) 10-inch air valve was installed on the ntclair line on air valve No. 6.

e 4 - 30-inch Coffin gate valves at Canistear were serviced during e dry period when elevation of reservoir was low enough to allow ch inspection and repairs if necessary.

e 48-inch horizontal valve at Prescott and Ridgewood Avenues, ntclair, was completely overhauled during the period that the 60-inch ntclair line was unwatered for Contract 88.

PATROLLING PIPE LINE

e pipe line right of way from Macopin to Bloomfield Avenue Tower is vided into five sections, one of which is walked on successive days one man assigned regularly to this work. Once a week, thereby, each ction is covered to locate leaks, release air that is collected in e air valves, check conditions of the right of way structures, port all construction work which might affect the pipe line right of y, and make a general check of the system. In periods when snow evails, as a precautionary measure, two men are assigned to patrol e sections covered by foot. City beats are covered by two men, with tor truck, one day each week.

METER READING AND SERVICING PRESSURE REGULATORS AND CONE VALVES

ading of 9 out of town meters connected to the Transmission System re taken the first day of each month.

e usual periodical inspection of the regulator at Packanack Lake was de. The operating mechanism of the regulator was removed, thus ving Packanack Lake full Pequannock pressure.

l cone valves were inspected, and lubricated, semi-annually.

SUPERVISION AND INSPECTION OF WORK PERFORMED BY CONTRACTORS

e following contracted construction work was supervised and inspected the Transmission Lines force:

ntract No. 88 - Cleaning and Lining Steel Pipe Line with Cement rtar, by Centriline Corporation.

e 60-inch Line from Grove Street, Montclair, to Bloomfield Avenue and rth 7th Street, Newark.
e 48-inch section of this Line from North 6th Street to North 5th reet, on Bloomfield Avenue, Newark.

ntract No. 95 - Installation of Cone Valves and Venturi Meters, by
Harrison & Sons.

" x 22½" Venturi Meter on the No. 1 Line and a vault at Macopin.
" x 22½" Venturi Meter and 20" Cone Valve in the No. 1 Line at
ralemon Street, Belleville.
" x 22½" - 3 sections of Venturi Meter and 18" Cone Valve in the
. 2 Line.
nstruction of a new vault housing the inlet and throat sections of
e Venturi Meter and the 2 Cone Valves.

e above work was completed by the end of the calendar year. Balance
contract to be completed in 1950.

e 18-inch East Orange connection at LaFrance Avenue, Bloomfield.
rk performed by H. L. Harrison & Sons for East Orange Water Depart-
nt. Cost of supervision and inspection by Little Falls force was
arged to the East Orange Water Department.

retaining wall, erected by the State Highway Department at the toe of
ope at Great Notch, adjacent to and including a portion of our right
way.

12-inch sanitary sewer by the City of Clifton, under our lines in
e vicinity of W.P.A.T. Tower west of Broad Street, Clifton. Cast
on pipe was used at this point.

12-inch steel gas main over our lines, in the north shoulder of
ralemon Street, Belleville. Work was performed by contractor for
blic Service Gas & Electric Company.

MISCELLANEOUS WORK

mpleted work in connection with installing new chlorinators, chlorine
sidual recorders and pumps at Macopin Treatment Plant and Test House.

new hot dipped galvanized grating was installed on the foot bridge
d balcony of the West Gate House at Cedar Grove Reservoir. Grating
s secured to iron members of bridge by welding. The wooden supports
re replaced with rectangular supports fabricated from a 3-inch angle
on.

e storage shed at Little Falls was completed during the year. Air
lves, gate valves, lumber, etc. are now stored there.

th Cedar Grove Reservoir lowered about 15 feet, and 30 new stop logs
aced to permit an inspection of the northerly pair of wells in the
st Gate House, to determine the extent of repairs required, the
llowing conditions were noted and work done:

e sluice gates and screen guides were found to be in working condi-
on. These were scraped, wire brushed, and two coats of paint applied.

e operating collar on one of the 8-inch blow-off valves was found to
broken and was repaired.

cessary supplementary measurements were taken for the ordering of
chanical screens to be installed at some future date.

n additional 20 logs were ordered, for a total of 50, which will be ufficient for future use in conjunction with a lowered elevation of he water level.

asonry work, interior and exterior, was found to be in good condition enerally. Considerable pointing up was done on the exterior walls.

everal loads of Kanouse fill were hauled to railroad siding at harlotteburg to expedite unloading cars of chlorine.

ismantling of the wooden frame structure of the No. 1 Pequannock ine bridge, crossing the Passaic River at Little Falls, was completed. he structure at Pequannock was partly dismantled, to be completed in 950.

wo (2) 8-inch pipes used for drainage across the right of way at errace Lake were removed and two (2) larger open stone culverts were onstructed.

4-inch transite line was installed for the water eductor in the cone alve vault at the Golf Course, Clifton, to drain into the brook ather than on the surface of the right of way and the Golf Course.

ew laboratory faucets were installed at Great Notch Crossovers for ampling purposes.

new 8-inch check valve was installed on each of Wayne Township's onnections. Costs of material and installation were defrayed by hat Township.

anterns and fires were maintained at critical points during the inter months to prevent freezing of air valves, taps, etc.

he hand operated screens in the West Gate House of Cedar Grove Reser- oir were cleaned periodically during the year.

everal test holes were excavated for the proposed cone valve installa- ions in the vicinity of Bloomfield Avenue Tower. Locations were stablished by the Engineers office force.

treet boxes over the valves of the Montclair standby connections at rove Street, Clifton, were located and raised to grade.

ll installations at Macopin Gate House were scraped and painted.

everal tons of weeds were removed from Macopin Intake Reservoir. teel floats which support chain drags, towed by two boats equipped ith outboard motors, were used to remove the sub-aqueous growths. n addition, crews, equipped with boats and rakes, cleaned along the hore at times when the reservoir was lowered.

now at Little Falls storehouse, on roadway around Cedar Grove Reser- oir, at Great Notch Crossovers, and at other strategic points along he pipe line, such as foot bridges and tops of Passaic River bridges ousing the No. 1 line at Pequannock and Little Falls, was plowed and emoved.

he interiors of the Butler, Mountain Avenue and Great Notch Gate ouses were cleaned periodically.

he 4-inch line for New City was unwatered during the winter months
s a precaution against freezing. Line is restored to refill the
torage reservoir when required.

CEDAR GROVE RESERVOIR

t Cedar Grove Reservoir daily records were kept of reservoir elevations, of water drawn from the reservoir, and the weather, including aximum and minimum temperatures, amount of rainfall and snowfall, he amount of snow on the ground and evaporation. A copy of these eather reports is forwarded to the U.S. Government Weather Bureau ffice at Albany, New York.

hore and boat patrols around the reservoir, when possible, were made eekly, and the condition of the shore line noted.

he upstream and downstream faces of the dams were mowed approximately very two weeks during the growing season, as were also the flats djoining the dams. The shore line at the north and east side of the eservoir was mowed all around the water edge. The brush and grass nside the fence was cut, mowed and burned, and the grass on the houlders of Ridge Road and Reservoir Drive was mowed when necessary.

n July 13th the shore line of the reservoir was treated with 900 ounds of copper sulphate.

rom August 18th to 26th Cedar Grove Reservoir was bypassed.

ugust 19th the reservoir was treated with 2072 pounds of copper ulphate in solution throughout the reservoir.

ugust 22nd the shore line of the reservoir was treated with 1150 ounds of copper sulphate.

VALLEY ROAD TREATMENT PLANT

his plant, in operation during the year, treated an average of 1 m.g.d. of water with chlorine, the treatment varying between 0.61 .p.m. maximum and 0.22 p.p.m. minimum. Chlorine residual averaged .25 p.p.m. and 36 one-ton containers of chlorine were used.

ourly and daily readings were taken of the total flow through the enturi meter, rate of flow per 24 hours through the meter, pounds of hlorine used per 24 hours, and chlorine tank weight loss, also aily water temperature.

aily operating reports were made out covering every hour, and submitted to the Cedar Grove Laboratory.

DISTRIBUTION SYSTEM

he work done during 1949 in connection with the improvement, opera-
ion and maintenance of the Distribution System by City forces and by
ontract is set forth herewith.

n addition to the actual work of installing mains and other appurte-
ances, within the limits of public streets, by Division forces, and
he inspection of similar work done by contract, all of which work is
isted herein under Main Extensions and Replacements, some street
avement restoration work in water utility cuts throughout the City,
lso done by contract, was supervised and inspected. Reference is
ade in the Engineering Section of this report to the general scope
f the various contracts for water main extension, replacement, water
ervice connection work and other improvements in the system either
ct or contemplated during the year.

he Division section crews carried on, as work schedules would permit,
heir regular inspection, maintenance and repair on gate valves,
ydrants and pressure regulators throughout the system. The two
lumbing crews for service connection work, and the night emergency
rews continued.

he (1) break of major importance occurred during the year in the City
istribution System.

t 9:20 A.M. on Friday, December 9, 1949, a bad break occurred on the
+-inch cast iron Forest Hill Feeder in the south side of Heller
arkway at the foot of the easterly approach to the bridge over City
ailway. A 12 foot section of cast iron pipe split along its horizon-
al axis, with a resultant serious pressure drop and considerable loss
f water, unfortunately, at a time water shortage was becoming acute.
he water released at the break caused flooding of the Essex County
ark Commission's Branch Brook Park Garage Headquarters and Green-
ouses, as well as a section of the City Railway to the north and
outh of Heller Parkway, and washed out a sizable section of street
avement. Shut-offs were effected by Division of Water crews as soon as
s practicable, and pressures were completely restored about 12 noon.
epairs were made shortly thereafter.

he regular weekly inspection and maintenance of all recording instru-
ents and gauges was continued during the year.

ll records were kept up to date, as usual, during the year.

nspection survey of water service connection curb boxes in the City
s continued, and repair notices were sent to owners where sidewalk
epairs or replacements had been ordered by the Street Department, or
here the condition was particularly dangerous.

erating Sheets and Sectionalizing Diagrams for the larger mains were
evised where necessary to keep them up to date.

CHANGES IN PRESSURE ZONES

February, 1949 areas of too low pressure in South Orange Avenue
servoir Level, between Peshine Avenue and Bergen Street, from
wthorne Avenue to Renner Avenue, and from Hawthorne Avenue to Clinton
enue between Badger and Peshine Avenues, were added to the Sub-Cedar
ove Level supplied through the Lyons Avenue regulator.

DISTRIBUTION SYSTEM - GENERAL

e total length of water mains of various diameters owned by the City
the General Purpose Supply - Low Pressure System, including trans-
ssion mains, is now 555.93 miles, and in the Special Segregated High
essure Fire System 29.14 miles.

nnected with the mains in the General Purpose Supply - Low Pressure
stem are 4514 fire hydrants; in the High Pressure Fire System 393.

ere are 8698 gate valves which control the flow of water in the mains
the Low Pressure System, and 286 gate valves controlling the flow
water in the High Pressure Fire System.

ere are 71,605 water service connections, designated as "Services"
the Low Pressure System, of which 54,479 are in use. Through these,
ter for domestic, commercial, public and fire use is drawn.

ere are 319 water service connections in the High Pressure Fire
stem, of which 263 are in use.

e water pressures in the General Purpose Supply System range from 30
130 pounds, and in the High Pressure Fire System from 100 to 160
unds per square inch.

GENERAL PURPOSE SUPPLY - LOW PRESSURE SYSTEM

IN EXTENSIONS AND MAINS LAID AS REPLACEMENTS.

INS EXTENDED DURING THE YEAR

City Forces - with Contractor's aid:

Avenue "K" - From 820' south of Wilson Avenue - southerly
310 linear feet of 6-inch diameter cast iron pipe.

Bellair Pl. - From Montclair Avenue - northerly
324 linear feet of 6-inch diameter cast iron pipe.

Contract - No. 83:

Delancy Street - From Stockton Street - easterly
473 linear feet of 30-inch diameter cast iron pipe.
1072 linear feet of 12-inch diameter cast iron pipe.

INS LAID AS REPLACEMENTS DURING THE YEAR

City Forces - with Contractor's aid:

Avenue "K" - From 600' south of Wilson Avenue - southerly
218 linear feet of 6-inch diameter cast iron pipe.

Contract - No. 83:

Magazine Street - From Rome Street to Ferry Street
2167 linear feet of 12-inch diameter cast iron pipe.

125 linear feet of 8-inch diameter cast iron pipe.
12 linear feet of 6-inch diameter cast iron pipe.

. Sixth Ave. West - From Third Street to Roseville Avenue
1499 linear feet of 12-inch diameter cast iron pipe.
264 linear feet of 8-inch diameter cast iron pipe.

y Port of New York Authority (By Lease Agreement):

. South Dock Street - From Intercoastal Street to Oceania Road
674 linear feet of 12-inch diameter cast iron pipe.

. South Dock Street - From Coastwise Street to Import Street
565 linear feet of 10-inch diameter cast iron pipe.

SUMMARY

AIN EXTENSIONS AND REPLACEMENTS IN 1949:

6-inch Cast Iron	-	864	linear feet	-	0.164	miles
8-inch " "	-	389	"	"	-	0.074	"
0-inch " "	-	565	"	"	-	0.107	"
2-inch " "	-	5,412	"	"	-	1.025	"
0-inch " "	-	473	"	"	-	0.090	"
otal		7,703	"	"		1.460	"

AINS ABANDONED IN 1949:

4-inch Cast Iron	-	218	linear feet	-	0.041	miles
6-inch " "	-	4,056	"	"	-	0.768	"
8-inch " "	-	3,685	"	"	-	0.698	"
0-inch " "	-	494	"	"	-	0.094	"
2-inch " "	-	665	"	"	-	0.126	"
otal		9,118	"	"		1.727	"

FT DEDUCTIONS TO SYSTEM
N 1949: 1,415 linear feet 0.268 miles

he total amount of pipe of various diameters in the Newark General urpose Supply System on December 31, 1949 was 2,935,308 linear feet - 55.93 miles (itemized as shown):

4-inch diameter	Cast Iron	51,646	linear feet
6-inch "	" "	1,290,828	" "
8-inch "	" "	461,520	" "
0-inch "	" "	91,870	" "
2-inch "	" "	304,670	" "
4-inch "	Wrought Iron	517	" "
6-inch "	Cast Iron	84,220	" "
0-inch "	" "	84,011	" "
4-inch "	" "	109,864	" "

4-inch diameter	Steel (26" O.D.Cement Lined)	359	linear feet
0-inch "	Cast Iron	41,036	" "
6-inch "	" "	53,496	" "
6-inch "	Steel	20,549	" "
2-inch "	Cast Iron	343	" "
2-inch "	Steel	84,897	" "
8-inch "	Rein. Conc. Pressure	13,208	" "
8-inch "	Steel	151,122	" "
0-inch "	Cast Iron	3,360	" "
0-inch "	Steel	87,792	" "
ctal		2,935,308	linear feet

555.93 miles

TER SERVICE CONNECTIONS: The number of low pressure service connections made during the year was 297, listed as follows:

194 - 1	inch	diameter
30 - 1½	"	"
27 - 2	"	"
7 - 3	"	"
11 - 4	"	"
28 - 6	"	"

e total number of existing low pressure services in the system at e end of the year 1949 was 71,605, while the number of services in tual use was 54,479. The difference shows the services installed in vance of street pavements.

DRANTS: During the year 34 low pressure hydrants were set. Of ese 24 were replacements of old hydrants and 10 were additions. o (2) were taken out and not replaced, making the total number of drants in the low pressure system at the end of 1949 as follows:

In the City	4,465
Silver Lake Section and Belleville	49
Total	4,514

SPECIAL SEGREGATED HIGH PRESSURE FIRE SYSTEM

IN EXTENSIONS: High pressure mains extended in the System during the ar are listed as follows:

City Forces - with Contractor's aid:

Springfield Avenue - From Howard Street - westerly
99 linear feet of 16-inch diameter cast iron pipe.

Contract - No. 83:

Van Buren Street - From Ferry Street - northerly
452 linear feet of 12-inch diameter cast iron pipe.

he total amount of pipe of various diameters in the Newark High ressure Fire System on December 31, 1949 was 153,885 linear feet - 9.14 miles (itemized as shown):

6-inch	diameter	Cast Iron	515	linear feet
8-inch	"	" "	7,574	" "
2-inch	"	" "	70,057	" "
6-inch	"	" "	44,318	" "
0-inch	"	" "	23,829	" "
4-inch	"	" "	2,563	" "
0-inch	"	" "	5,029	" "
otal			153,885	linear feet
			29.14	miles

ATER SERVICE CONNECTIONS: The total number of existing high pressure ervices in the system at the end of the year 1949 was 319, while the umber in actual use was 263. The difference shows the services nstalled in advance of street improvement.

wo (2) high pressure services were installed during the year 1949; one were discontinued.

YDRANTS: During the year 1949, one (1) new high pressure hydrant was et. None were replaced and none taken out, leaving a total of 393 igh pressure hydrants in the system at the end of the year.

REGULAR MAINTENANCE SECTION CREWS

reaks on mains, numbering 18, were repaired, and a total of 2106 eaks - covering mains, hydrants and services - were investigated, nd, when necessary, repairs were made.

oor pressure complaints, numbering 1,365, were investigated, and 46 ervice taps were cleaned out or replaced at the main.

orty-five (45) curb boxes were replaced with new ones, and 357 were epaired; 34 curb stops were replaced, and 2 were repaired.

uring periodic inspection over the system, a total of 308 valves were perated and inspected.

ixty-four (64) valves were repaired, and 16 replaced.

ne hundred seventy five (175) valve street boxes were repaired, and 5 replaced.

total of 2094 hydrant repairs were made, most of which were neces- ary because of improper and unauthorized use of hydrants during hot eather. Hydrants to the number of 2,579 were inspected.

PLUMBING INVESTIGATIONS

pecial surveys of the water pipe layouts in manufacturing and industrial plants, and service connections to buildings, were made, and ecords in the form of maps are being completed and brought up to te. Thousands of dollars are being saved yearly by this work, as ad services and leaks are constantly being discovered, as well as ther irregularities in the way of connections inside of the water eters, etc. A great many of these irregularities are brought to ttention by abnormally large or small water bills. Reports on such urveys are extremely valuable in cases of water searches and liens hen properties change hands.

pecial investigations were made of 354 unmetered fire supply water ystems in buildings. There are 909 such accounts, leaving 555 still o be completed. A total of 8 of these fire lines were found to be nnected directly to the sanitary sewer, a serious risk to the water upply. Notices were sent to the owners ordering them to have these onnections divorced from the sanitary sewer and spilled out into the en or into an open fixture. As of December 31, 1949 all have omplied with the requests, and installations have been checked and ound to comply with the sanitary code.

eventeen (17) cross connections between air conditioning units and efrigeration plants were reported and notices sent to owners to emove said connections. As of December 31, 1949, 13 have complied ith the request. Follow-ups on these violations are being carried ut.

nspection of all water services as to their proper installation, dvice as to the size of water service necessary for buildings, plants, tc. in order to give proper supply to meet requirements, and inspections of all repaired, new or relaid water services were taken care f, amounting to 867. Water service inspection fees amounted to 911.00.

nspections and readings were made of all water meters at Port ewark Army and Newark Air Base - monthly and weekly.

ater meters supplying other municipalities were read weekly, the otal of such readings being 755 for the year.

eventy (70) complaints, some anonymous, by licensed plumbers and roperty owners, that handy-men, unlicensed plumbers or property wners were either installing, repairing or tampering with water ervices or meters, or digging for curb boxes without the proper ermits, were investigated.

son and building inspectors reported on 108 demolitions of buildings nd forwarded to the Division of Accounts, for their records, reports hat the water was ordered turned off. Total mason inspections ounted to 3811. Mason water receipts amounted to $1,140.83.

connection with cross-connections and foreign water supplies, nvestigations were made of 55 such connections at 27 industrial lants, office buildings, breweries, power plants, etc., and other roperties where foreign supplies, such as driven wells and river ter, are used for cooling and processing purposes and for air conditioning. One hundred seven (107) wells were found in use during the

ear, and 91 existing wells were found not in use due to the low level f water table.

uarterly inspections on 3 existing and approved foreign connections, ith double bronze check valves, were made in the following plants:

Celanese Corporation of America	-	Ferry Street
Merchants Refrigerating Company	-	Avenue "C"
White Laboratories, Inc.	-	North 13th Street

hree (3) of these quarterly tests were pressure tests only, and ne (1) an internal as well as pressure test. The internal test equires that the valve be taken apart for inspection, as required y the New Jersey State Health Department, and Investigators were ccompanied on such tests by an Inspector of the local Health epartment.

n connection with the foregoing work, and in addition to the inves- igations mentioned specifically, the following work was done during he year.

Special Readings	867
Service Inspections.	673
Special Investigations	3,130
Meter Inspections.	3,585
By-Passes Sealed	116
Surveys and Drawings	3
Search Inspections	4
Tap Inspections	355

Assessed Investigations:

Barracks	58
Homettes	70
Johnson Houses	94

METER LABORATORY

e Meter Laboratory, located at 332 South 8th Street, Newark,
w Jersey, is responsible for the servicing and proper functioning of
ery water meter on Newark water services. Accurate records are kept
each meter, giving in detail its location, size, make and number,
d an account of all tests, repairs and charges from the original date
purchase until the meter is scrapped.

ters to the number of 5856 were handled and serviced in varying
grees during the year 1949, covering the range of sizes and makes in
rvice, a detail of which work follows:

Laboratory		On Premises	
maged by frost.	149	Inspections	755
uck	1825	Special readings.	116
maged by heat	71	Tests (2" and larger) . . .	93
w meters tested	1003	Major repairs	438
ters tested for curacy (no repairs cessary).	321	Minor repairs (glasses, lids, re-seals and leaks)	1085
	3369		2487

ring the year 1324 meters were removed from the premises and brought
the Meter Shop by City forces, and 1916 by licensed plumbers; 978
re reset by City forces, and 1494 by plumbers. Of the meters
ought to the shop, 1156 were tested before repairs, 1995 were tested
ter repairs, and 798 were condemned because of extreme wear, severe
mage by frost or heat, or obsolescence.

ter repairs are still somewhat delayed due to the lack of promptness
the procurement of meter replacement parts.

e stockroom, containing meter parts and general supplies, continued
charge of one man, who was responsible for the disposition and
plenishment of materials. The resulting perpetual inventory assures
e proper accounting and charging for all materials, and the antici-
ting of requirements.

accordance with Rules and Regulations of the Division of Water, the
ndling of all water meters, either new or old, was by licensed
umbers or by Division of Water employees. The card system listing
e names and signatures of licensed plumbers was kept up to date
ring the year, and all work was checked to make certain that it was
ne by an accredited plumber.

e work of the Meter Laboratory was coordinated with the work of the
counting Division, meter testing forces and plumbing investigators.
rsonal contacts were made three times weekly, and, in addition,
itten weekly and special reports were exchanged.

riodic field testing of meters, 2-inch and larger, was continued
ring the year by special crews engaged on this work; periodic testing
small meters on the premises was carried out by the regular Meter
op forces as schedules and time would permit.

here were still on file at the end of 1949 many hundreds of meter omplaints which required attention. Of these scores were 2-inch and arger.

n the last few months of 1949, because of the water shortage, a etermined effort was made to take care of the many leak complaints hich had accumulated during the year, even though most of these eaks are insignificant.

DEPARTMENT OF PUBIC WORKS

DIVISION OF WATER

NEWARK, NEW JERSEY

WATER SUPPLY STATISTICS

FOR YEAR ENDING DECEMBER 31, 1949

****

Population by census, 1940	430,000
By whom owned	City of Newark
Source of supply	Pequannock and Wanaque Watersheds
Method of supply	Gravity

STATISTICS OF CONSUMPTION OF WATER

Population City of Newark (Estimated 1949)	440,000
Consumption for year, City of Newark	24685.4 m.g.
Consumption for year, Town of Belleville	915.3 "
Consumption for year, Town of Bloomfield	1717.3 "
Consumption for year, City of Elizabeth	2576.8 "
Consumption for year, Township of Wayne	46.7 "
Consumption for year, Packanack	83.6 "
Consumption for year, Verona, Essex County Hospital ...	54.7 "
Consumption for year, Elizabethtown Water Co.	19.0 "
Consumption for year, Commonwealth Water Co.	601.4 "
Consumption for year, Pequannock Township	25.7 "
Consumption for year, City of East Orange	5.7 "
Total consumption for year	30731.6

Passed through meters in the City	23082.0 m.g.
Percentage of consumption metered in City	93.5%
Average daily consumption, City and Suburbs	84.2 m.g.
Average daily consumption in the City	67.6 "
Gallons per day to each inhabitant in City	153.7

STATISTICS REGARDING DISTRIBUTION SYSTEM

GENERAL PURPOSE SUPPLY SYSTEM

Kind of pipe in distributing mains	Cast Iron, Steel, Concrete
Pipe sizes (diameter)	4-inch to 60-inch
Net deductions during the year	1,415 feet
Total length now in use (all sizes)	555.93 miles
Number of hydrants added during the year	10
Number of hydrants discontinued during the year...	2
Number of hydrants replaced with new or reconditioned hydrants	24
Number of hydrants now in use	4,514
Number of stop gates - valves - added during year.	6
Number of stop gates - valves - now in use	8,698
Range of pressure in distributing mains	30 to 130 lbs.

SPECIAL HIGH PRESSURE FIRE SYSTEM

Kind of pipe in distributing mains	Cast Iron
Pipe sizes (diameter)	6-inch to 30-inch
Net additions during the year	551 feet
Total length now in use (all sizes).....	29.14 miles
Number of hydrants added during the year	1
Number of hydrants taken out during the year	None
Number of hydrants replaced with new or reconditioned hydrants	None
Number of hydrants now in use	393
Number of stop gates - valves - added during year.	1
Number of stop gates - valves - now in use	286
Range of pressure in distributing mains	100 to 160 lbs.

CONSUMER SERVICES - GENERAL PURPOSE SUPPLY SYSTEM

Kind of service pipe	Lead, Brass, Copper, Cast Iron
Pipe sizes (diameter)	5/8-inch to 16-inch
Total number of services in System, Jan. 1, 1949 ..	71,585
Total number of services added during 1949	297
Total number of services abandoned during 1949	277
Services as of December 31, 1949:	
Total in System	71,605
Total in use (other than fire line)	53,539
Total in use (other than fire line) metered	53,292
Total in use (other than fire line) unmetered ...	247
Percentage in use (other than fire line) metered.	99.5+
Total fire lines in use	940
Total fire lines in use, metered	86
Total fire lines in use, unmetered	854
Percentage of fire lines in use, metered	9.15

CONSUMER SERVICES - SPECIAL HIGH PRESSURE FIRE SYSTEM

Kind of service pipe	Cast Iron
Pipe sizes (diameter)	1-inch to 8-inch
Total number of services in System, Jan. 1, 1949	317
Total number of services added during 1949	2
Total number of services abandoned during 1949	None
Services as of December 31, 1949:	
Total in System	319
Total in use (other than fire line)	16
Total in use (other than fire line) metered	12
Total in use (other than fire line) unmetered	4
Percentage in use (other than fire line) metered	75.00
Total fire lines in use	247
Total fire lines in use, metered	73
Total fire lines in use, unmetered	174
Percentage of fire lines in use, metered	29.55

E N G I N E E R I N G

IMPROVEMENTS AND EXTENSIONS - CONTRACTS

CONTRACT 65 - RELAYING WATER PIPES IN STATE HIGHWAY ROUTE 25: On Contract 65, awarded to C. Salvatore & Sons, Inc. in 1946 and completed in November, 1946, the final estimate for $57,640.32 had been authorized by resolution of January 2, 1947. Payment on this estimate would not be accepted by the Contractor, who made claims for further additional payments which became involved with the State. Late in 1948, this matter between the City and Contractor had been finally compromised and the extra payment of $7,056.00 was authorized by resolution #9003 of December 15, 1948. This amount was included in the 1949 budget of the Division of Water as a line item for a 1946 unpaid bill, and final payment of $7,056.00, in connection with this work, was made on April 1, 1949.

CONTRACT 77 - INSTALLING CONE VALVES: Contract 77 consisted of installing cone valves and steel reducers at Bloomfield Avenue, corner of Seventh Street, Newark, Grove Street near Alexander Avenue, Montclair, and in the Golf Course east of Broad Street, Bloomfield. Work had been completed in 1948 and final estimate amounting to $27,137.65, dated August 26, 1948, was unacceptable to the Contractor. He had refused to take payment and had submitted a claim for $8,255.70 covering the extra cost to the Contractor for idle equipment because of delays to the work, alleged to be the fault of the City. As of December 31, 1949, payment on this contract had not been made. Decision from the Law Department as to the Contractor's claim has been pending for more than a year.

CONTRACT 79 - IVY HILL PARK - INSTALLING OF WATER MAINS AND SERVICE CONNECTIONS: Work on Contract 79 had been completed in November, 1948 and final estimate prepared for $23,756.28. Payment had been withheld during 1948 due to the fact that the Contractor was to return to the City materials loaned him in connection with this contract. Final estimate for $23,756.28 was presented and paid on February 2, 1949.

CONTRACT 83 - INSTALLING CAST IRON WATER MAINS IN SIXTH AVENUE WEST, AND IN DELANCY, MAGAZINE AND VAN BUREN STREETS: Contract 83 for the installation of 12-inch low pressure cast iron water mains in Sixth Avenue West, in Delancy Street and in Magazine Street, and 12-inch high pressure main in Van Buren Street, had been started by the Nesto Construction Company, 872 Broadway, Newark, New Jersey, on December 15, 1948. Work was started on the 30-inch main in Delancy Street, followed by the 12-inch in this street, both of which were completed by January 19, 1949. The 12-inch high pressure in Van Buren Street was completed on February 16, 1949, the 12-inch in Magazine Street on March 23, 1949, and the 12-inch in Sixth Avenue West on July 15, 1949. Restoration of street pavement was included in the contract work. Final estimate amounting to $48,846.75 was paid August 1, 1949.

CONTRACTS 86-A and 86-B - INCINERATOR BUILDING FOR PEQUANNOCK WATERSHED: A building to house a new incinerator for the Pequannock Watershed area had been constructed almost to completion in 1948. Location was at a point just below Macopin Intake. Final estimate for Contract 86-A with Mahieu Construction Company, 38 Wagawaw Boulevard, Paterson, New Jersey, for general construction, and amounting to $24,633.60, had been prepared for payment on December 20, 1948. Payment was made during January, 1949.

Under Contract 86-B with Breen Iron Works, 1444 Chestnut Avenue, Hillside, New Jersey, for structural steel work for the building, steel windows were installed during March, 1949 and work was completed in April, 1949. Final estimate amounting to $7,397.00 was prepared on April 25, 1949 and paid during May, 1949.

Installation of incinerator was completed on April 21, 1949. It had been purchased from Morse Boulger Destructor Company, 205 East 42nd Street, New York City, out of 1947 operating funds, at a price of $16,407.00.

Roadway to incinerator was completed by City forces, and improved later, during May and June, 1949, as to visibility at its point of junction with State Highway Route 23.

CONTRACT 88 - RECONDITIONING 60-INCH CEDAR GROVE RESERVOIR AQUEDUCT:
Contract 88 for the work of cleaning and lining the 60-inch riveted steel pipe line from Cedar Grove Reservoir, between Grove Street, Montclair near Alexander Avenue, to the Bloomfield Avenue Tower on Bloomfield Avenue at Sixth Street, had been awarded to the Centriline Corporation, 140 Cedar Street, New York City, on December 28, 1948 for $139,577.50.

Work started on January 12, 1949 on excavations for cuts in the section of the line between the 24-inch cone valve at North 7th Street in Bloomfield Avenue and the 48-inch gate valve in Bloomfield Avenue at Tony's Brook. Section was cleaned by machine from the North 7th Street end toward Tony's Brook. National Water Main Cleaning Company directed cleaning operations by portable radio. Rates of 35 m.g.d. or more were required for the cleaning procedure. Section was shut down January 20, 1949. Four attempts were necessary, between January 23 and February 18, before the section was cleaned. In all but the last the cleaning machine was wrecked part way through the section. By the end of February the 6000 feet of 60-inch to Tony's Brook was lined. The Grove Street connection from which the Town of Bloomfield obtained part of its water was out of service during these operations. The section, having been chlorinated, was returned to service on March 9, 1949.

On that day the Grove Street Bloomfield connection was restored to service, the Broad Street Bloomfield connection was shut off, and the 60-inch line from Alexander Avenue to Tony's Brook was put out of service for cleaning and lining. One run of cleaning machine from Alexander Avenue to Ridgewood at Watchung, on March 10, 1949, was considered sufficient, but two runs from Ridgewood at Watchung to Valley Road, one on March 15-16 and one on April 2, were required. Rates of flow for cleaning these sections were at times 40 to 45 m.g.d. Additional hand cleaning was necessary in both sections. Lining was placed to Ridgewood by March 30, before the second run of the cleaning machine was made in the section beyond. Lining was completed to Tony's Brook by early May, 1949. By May 11, the line between Grove Street at Alexander Avenue and Tony's Brook had been chlorinated, and on that day was returned to service.

Final estimate amounting to $136,695.25 was prepared during May, 1949, and paid about June 15, 1949.

Indications are that, as a result of cleaning and lining this 60-inch pipe with cement mortar, its carrying capacity has been increased by at least 75 per cent.

CONTRACT 92 - ELECTRICAL WORK MACOPIN GATE HOUSE AND TREATMENT PLANT: Contract 92 for electrical installations to serve new chlorinators and chlorine controlling and recording mechanisms at the Macopin Intake Treatment Plant had been awarded to the low bidder, the Margoli Electric Company, 90 First Street, Newark, New Jersey, for the lump sum of $3175.00 on December 1, 1948. Early in January, 1949, work started with the installation of two Parkway cable - each 2 conductor, #14 gauge - underground between chlorine residual recorders in the Treatment Plant and residual chlorine cells in the Test House distant about 1400 feet. Later, twenty existing poles in the 115-230 volt power distribution line between the Macopin Gate House and the Test House were replaced. Two electric heaters were installed in the Test House. Circuits for the various heaters, recorders and controls were provided. Work was spread out over several months because of delay in installing chlorinators and appurtenant equipment. Work was completed early in July, 1949 and final estimate of $3175.00 was prepared and paid.

CONTRACT 93 - STEAM BOILER AND OIL BURNER UNIT FOR METER LABORATORY, 332 SOUTH 8TH STREET: The work of removing old steam heater at the Meter Laboratory and installing new oil fired boiler, under Contract 93 with Harry J. Schwarzwaelder, Inc., 11 Blum Street, Newark, New Jersey, had been practically completed at the end of December, 1948, with new heating unit in service. Hot water storage tank was installed and work completed by January 5, 1949. Final estimate, amounting to the lump sum bid price of $3200.00,was prepared and paid about January 17, 1949.

CONTRACT 94 - PAVEMENT RESTORATION OVER RECENTLY INSTALLED WATER UTILITIES: It being impossible, with City forces, to catch up with the accumulation of pavement cut restorations over excavations made by the Division of Water for service installations and repairs of mains and services, Contract 94, for pavement restoration over water utilities, was prepared in February, 1949, advertised on April 9, 1949 for bids to be received on April 21, 1949. Two (2) bids were received, low bidder being M. J. Sheridan & Son, 168 - 12th Avenue, Newark, New Jersey, whose bid was $14,287.50. Work was started May 25, 1949 and completed July 20, 1949. There were 225 cuts restored and the average size was 2-2/3 yards. Final estimate was prepared, dated July 28, 1949, for $14,044.86, and subsequently paid.

CONTRACT 95 - INSTALLING VENTURI METERS AT MACOPIN AND BELLEVILLE RESERVOIRS: During 1949 new Venturi meters to replace the old 48" x 22½" meters in the No. 1 - 48 inch Pequannock steel pipe line at Macopin Intake and at Belleville Reservoir, and to modify the 42" x 22½" cast iron meter in the No. 2 - 42-inch Pequannock steel line at Belleville were installed under Contract 95. New meters and parts had previously been purchased, together with S. Morgan Smith roto-valves which were to be installed on the outlet side of the throat sections of the new meters at Belleville. Throat sections of the new meters and corresponding sizes of cone valves are 20" for the No. 1 line and 18" in the No. 2 line.

Original meters in the No. 1 steel line were constructed of wood inside of the 48-inch steel pipe. They were built about 1900 and with a 36" x 16" cast iron Venturi in the Newark Pequannock System were the first meters ever built by the Builders Iron Foundry of Providence, Rhode Island, and the first Venturi meters in the world.

Contract 95 documents and plans were started during the month of

February, 1949, put aside because of other more urgent work until late summer, and then completed. Work was advertised on September 27, 1949 for bids to be received October 11, 1949. Four (4) bids were received, the lowest being that of H. L. Harrison & Son, Inc., of Westfield, New Jersey, for $20,475.00. Contract was awarded to the low bidder, who started work on November 2, 1949 at Macopin. By November 16, old meter had been taken out, new 48" x 22½" steel Venturi installed in No. 1 line, and line restored to service. New vault was also constructed for the meter.

On November 23, 1949 work was started at Belleville. Here one large vault was to house throat sections of both Venturi meters with the roto valves to be installed on the outlet ends of these throat sections. By December 7 excavation had been completed and No. 2 line was unwatered to allow the removal of sections of the old cast iron Venturi; and the installation of new 18" cast iron throat section and roto valve, together with the reinstallation of some sections of the old meter. Work on this line was completed and the line returned to service by December 14, 1949.

The No. 1 line was then unwatered, old steel Venturi removed and new 20" Venturi throat section with 48" x 20" steel pipe reducer and increaser and with 20" roto valve were installed. The No. 1 line was returned to service on December 21, 1949, and as of the end of the year there remained only the construction of the vault and the clean-up of the area to complete the work.

CONTRACT 96 - INSTALLING CAST IRON DISTRIBUTION MAINS - 1950: From time to time in the summer and fall of 1949, as various circumstances made it necessary to plan for the installation of new cast iron distribution mains, job maps were prepared for the work, the following being combined into Contract 96 for installing pipes and appurtenances furnished by the City:

In the Towns of Belleville and Bloomfield	-	Belmont Ave.	- 12" - 1400'
In the City of Newark	-	Abbotsford Ave.	- 8" - 100'
		Allegheny Ave.	- 12" - 300'
		Bigelow St.	- 12" - 850'
		Branch Brook Pl. & Montclair Ave.	- 8" - 1200'
		Campbell St.	- 6" - 500'
		Chestnut St.	- 8" - 700'
		Emmett St.	- 12" - 800'
		Freeman St.	- 16" - 1300'
		Jelliff Ave.	- 12" - 750'
		So. 13th St.	- 12" - 100'
		Vanderpool St.	- 12" - 520'
		Warwick St.	- 8" - 450'

On October 19, 1949, by Ordinance 796 in a Bond Issue authorizing $600,000.00, $150,000.00 was provided for this work. Necessary pipe, which was not already in stock, was ordered early in November, 1949. Contract documents were prepared during November and December, 1949, and at the end of the year were ready for advertising.

CONTRACT 97 - VAILSBURG FEEDER: Heavy rates of use of water throughout the Newark System and in the Vailsburg section of Newark during the exceeding hot and dry weather of June, 1949 caused serious lack of pressure in the Ivy Hill portion of the Vailsburg area, and made

evident the necessity for a large feeder main into the area. Such feeder main had been under study, in a preliminary way, for some time and had been included in various programs of future water construction. By Bonding Ordinance 796, of October 19, 1949, $400,000.00 was provided for this feeder in the $600,000.00 total.

Field survey for a 30-inch pipe to be laid from the vicinity of South Orange Avenue Reservoir to Sanford Avenue in the vicinity of Varsity Road was started in August, 1949. Contract drawings and specifications were started. Borings were taken at 13 locations along the line, during December, 1949, by A. J. Connolly, Inc. to determine the depth to rock in locations where it might occur, and the character of materials at other locations.

Contract 97, under which this work is expected to be done early in 1950, is for the furnishing and laying of about 12,000 feet of 30-inch pipe. Types of pipe under consideration are steel cylinder reinforced concrete pipe, precast or prestressed, and steel pipe suitably protected inside and out. As of the end of the year 1949, plans are practically completed and contract documents are being prepared.

CONTRACT 98 - RECONDITIONING THE 60-INCH CEDAR GROVE LINE: In the fall of 1949 plans and specifications were prepared for the reconditioning of the 60-inch steel pipe lines from Great Notch to Cedar Grove Reservoir and from the outlet end of the tunnel from Cedar Grove Reservoir to Grove Street at Alexander Avenue, Upper Montclair. Work was advertised October 27, 1949 for bids to be received November 7, 1949. Two (2) bids were received as follows:

Centriline Corporation	$60,138.
Spiniello Construction Co.-Nesto Construction Co.	60,475.

Contract was awarded to the Centriline Corporation, 140 Cedar Street, New York City, on November 16, 1949. As of the end of the year work had not started on this reconditioning.

CONTRACT 99 - INSTALLING CONE VALVES IN THE VICINITY OF THE BLOOMFIELD AVENUE TOWER: In connection with the proposed widening of Bloomfield Avenue, which has been in the preliminary stages for more than a year, 4 - 14" and 4 - 18" cone valves, ordered in 1948, were received from Chapman Valve Manufacturing Company early in 1949. During the first half of 1949, surveys, test pits and layouts were made for the installation of these valves on the various 36-inch pipe lines in the vicinity of the Bloomfield Avenue Tower and within the area affected by the proposed widening. Later it developed that the widening work would not progress actively until 1951, and work on the cone valve installations was set aside temporarily to allow other urgent work to be completed.

CONTRACT 101 - PAVEMENT RESTORATION OVER WATER CUTS: In December, 1949, Contract 101 for the restoration of pavement cuts over water utilities was started. A large amount of such work has again accumulated and it is proposed to restore about 225 of these cuts under a contract which shall be completed during the spring of 1950. Specifications, modified somewhat from the experience of similar work under Contract 94, were in progress at the end of the year.

SUPPLIES TO OTHER MUNICIPALITIES

(NOTE: FOR AMOUNTS DELIVERED SEE TABLE II, PAGE 4 OF REPORT.)

BAYONNE: The City of Bayonne continued to be supplied with water by the North Jersey District Water Supply Commission from the Wanaque System during 1949, at a price of $85.00 per million gallons, but again without formal written agreement. Newark shared in the revenue therefrom to the extent of $210,679.75, about $15,000.00 less than in 1948. Bayonne indicated to the North Jersey District Water Supply Commission its interest in a 15 m.g.d. share in a proposed Ramapo addition to the Wanaque Supply, which came to the fore actively in the fall of 1949 as a result of water shortage.

BELLEVILLE: The Town of Belleville continued to be supplied with water from the system of the City of Newark, at a price of $85.00 per million gallons, by contract effective January 1, 1944 for a period of 15 years. In general, Pequannock water was supplied to the Town, but from 2:30 P.M. July 18, 1949 to 10:00 A.M. September 22, 1949 Wanaque water was delivered to the lower area of the town which is supplied out of Belleville Reservoir. During this period Belleville Reservoir was emptied, cleaned, and kept out of service. Water in it had become unsatisfactory because of little draft from it during the summer month when an attempt was made to hold downtown Newark pressures at a better level by raising pressures a few pounds on the outlet side of the Wanaque regulators at Belleville.

BLOOMFIELD: Use of Pequannock water in the Town of Bloomfield for the year 1949 again exceeded 4.0 m.g.d. average, as has been the case since 1943. For all water in excess of 4.0 m.g.d. the Town pays the City of Newark at the rate of $100.00 per million gallons. For Pequannock water up to 4.0 m.g.d. the Town pays Newark $30.00 per million gallons in addition to allowing Newark the use and benefits of the Town's 4.0 m.g.d. Wanaque allotment. This is in accordance with contract dated December 31, 1940 which expires some time in 1956.

The Grove Street connection to the Town from the 60-inch Bloomfield Avenue steel line was shut off from January 20, 1949 to March 7, 1949, the section of the line from the Tower to Tony's Brook being out of service for reconditioning. During this time the Town was served satisfactorily from the Broad Street and Garrabrant Avenue connections. Also during this period the Town installed a new 12-inch connection at Grove Street through which together with the Garrabrant Avenue connection the Town was satisfactorily supplied while the Broad Street Bloomfield Center connection was out of service, March 7, 1949 to May 11, 1949,and the 60-inch Bloomfield Avenue line was shut down for reconditioning, Grove Street, Montclair, to Tony's Brook. The new 12-inch connection was without a recording meter until May 16, 1949. During the period March 7 to May 16, and at three or four other short periods of interrupted or erroneous recording of other meters, use through them was estimated by mutual agreement. From May 16 to August 18, the recording mechanism of the old 8-inch meter was used on the 12-inch Venturi meter of the new connection, and a correction factor applied in arriving at the amount used through the meter.

The Town of Bloomfield expressed its interest in the acquisition of a share in the proposed Ramapo addition to the Wanaque Supply, as proposed by the North Jersey District Water Supply Commission in the fall of 1949.

COMMONWEALTH WATER COMPANY: The Commonwealth Water Company took water through the Myrtle Avenue-16th Avenue connection to the Newark System during each month of 1949 except May. Contract terminating June 17, 1953 covers this auxiliary or standby supply to the Company from the City of Newark.

EAST ORANGE: Discussion of means of supplying East Orange with water from Newark while the 60-inch Bloomfield Avenue line was shut down for reconditioning early in 1949, led the City of East Orange to request an 18-inch connection directly off the 60-inch at LaFrance Avenue. Saddle or hat flange for the connection was ordered from A.P. Smith Manufacturing Company by East Orange on July 1, 1949. Arrangements were made for the installation of the connection by H. L. Harrison & Son, Inc. as soon as hat flange and tapping valve were ready. Excavation was started by the Harrison Company on November 23, 1949. City forces welded 18-inch saddle to the 60-inch pipe on December 7, 1949, with line under pressure, and made tap in the 60-inch steel, cement lined pipe, under pressure, using tapping machine and 16-inch cutter, with tungsten-carbide teeth, loaned by A. P. Smith Manufacturing Company. Much difficulty was encountered in making the cut, which was completed late in December, 1949.

ELIZABETH: The City of Elizabeth continued to show interest in obtaining ownership of a water supply and made application, in September, 1949, to the North Jersey District Water Supply Commission for a 12 m.g.d. share in the proposed Ramapo addition to the Wanaque Supply. Contract with the City of Newark for the supply to Elizabeth is at a price of $85.00 per million gallons, and runs to July 16, 1956.

PACKANACK LAKE: Water from the Pequannock System was supplied by Newark to Packanack Lake throughout 1949. There is no formal written agreement covering this supply. The charge continued at $103.50 per million gallons. Water was supplied from the No. 2 cement lined 42-inch pipe throughout the year, with the flow maintained at a rate to provide as much pressure as possible to the Packanack supply consistent with good operating conditions in the No. 2 line.

PEQUANNOCK TOWNSHIP: The Township was supplied with water from the Newark Pequannock System principally through the Pequannock Avenue connection from the No. 2 cement lined 42-inch pipe. Connection at Hopper Avenue off the No. 1 line was opened July 7, 1949 at the Township's request, but was closed again in three or four days by the Township, the Newark valve remaining open thereafter to the end of the year. Consumption in the Township nearly doubled in 1949 over 1948. Contract at a price of $90.00 per million gallons runs to 1956.

WAYNE TOWNSHIP: Pequannock water was supplied to Wayne by Newark through both the Black Oak and the Prospect Street connections off the No. 1 line. Since the installation of check valves on these connections, in 1948, there have been no reversals of flows through the meters, as often happened in the past. Contract at a price of $90.00 per million gallons runs to 1961.

OPERATING PROCEDURES AND STUDIES

PEQUANNOCK WATER TO CEDAR GROVE RESERVOIR: During 1949 Pequannock water was brought to Cedar Grove Reservoir through both Pequannock pipe lines, with flow in the No. 2 line uninterrupted, and, in general, at near capacity; and with flow in the No. 1 line varied as required, and interrupted as follows:

March 21 to 24, Macopin to Great Notch, for inspection of cement mortar lining - Contracts 63 and 70.

November 7 to 15, Macopin to Pompton Notch, for installing new Venturi meter at Macopin.

PEQUANNOCK WATER TO CITY FROM CEDAR GROVE RESERVOIR: Water to the City was delivered almost wholly from Cedar Grove Reservoir during 1949, with automatic cone valve at the Golf Course near Alexander Avenue and Broad Street, Bloomfield, set to deliver water directly from Macopin via Great Notch in case of need to support pressures in the City. These automatic valves opened for short periods of time on days of heavy consumption during the summer, when the 60-inch Bloomfield Avenue line was being cleaned in the spring of 1949, and on December 9, 1949 when a 24-inch cast iron pipe in Heller Parkway broke.

From January 1, 1949 to May 11, 1949, while the 60-inch Bloomfield Avenue line was being cleaned and lined, water from Cedar Grove Reservoir to the City was delivered without the assistance of this 60-inch line. From December 6, 1949 to December 12, 1949, the No. 2 line, and from December 13, 1949 to December 22, 1949, the No. 1 line, from the Golf Course to Belleville Reservoir were out of service for installation of new Venturi meters at the Belleville Reservoir end of the lines.

At other times both the Bloomfield Avenue and the Alexander Avenue 60-inch lines, and, in general, all lines from Belleville Reservoir to the City were used to transport Pequannock water from Cedar Grove Reservoir to the City.

Cedar Grove Reservoir was by-passed for copper sulphate treatment from August 17, 1949 to August 26, 1949.

Pequannock water to the amount of about 10 m.g.d. was delivered into the Wanaque level from the beginning of 1949 until mid January, and again from late May until mid October. About 2.5 m.g.d. are introduced at each of four locations and the opening of the valves at the various locations are spaced at weekly intervals so that the 7.0 pH Pequannock water will be properly assimilated by the 8.5 pH Wanaque water. The shutting off of the Pequannock into Wanaque is done more quickly, usually within a period of one week.

Cedar Grove Reservoir was drawn down in the fall of 1949 to permit the inspection and overhauling of the West Gate House. Work was done by City forces of the Little Falls pipe line crew. Outside of masonry walls to slightly below elevation 390 were repointed, a new set of 70 stop logs, each 14 inches wide, was procured and placed to unwater the northerly pair of wells, and all gates and appurtenants therein were cleaned, inspected and painted. Everything was in satisfactory condition except the operating stem of the 8-inch waste valve in the

bottom of the well nearer to the inlet from the reservoir. It had become detached from the valve with the valve in a partly open position. Repairs were made. While the wells were unwatered, measurements were taken at the bottom of the screen well from which the details of the base or boot section of mechanical screens, to be provided here, were determined so that the mechanical screens can be placed later without unwatering the wells.

Southerly wells in the West Gate House were not unwatered by placing the stop logs, but gates and appurtenances in the southerly screen well, the well nearer the reservoir inlet, were cleaned, inspected and painted down to elevation 389. Inlet concrete conduit along east shore of Cedar Grove Reservoir continued in service but was above the water surface in the reservoir while the work was in progress from mid October to mid December. There are leaks at many joints in this line and four or five sections are cracked on one side along the horizontal diameter for the entire length of the section. Work was suspended in mid December and level of Cedar Grove Reservoir was raised to cover this concrete conduit and prevent further damage by freezing.

In the reconditioning of the gates and appurtenances in the West Gate House wells, four types of protective materials were placed, which should be inspected from time to time to determine their effectiveness.

AUTOMATIC CONE VALVES IN GOLF COURSE, BLOOMFIELD: Automatic cone valves on the No. 1 and No. 2 steel pipe lines in the Golf Course near Alexander Avenue and Broad Street, Bloomfield, which since December 3, 1948 have taken the place of the Great Notch Regulator, were set to open when the pressure on the low side dropped to 80 pounds per square inch. They opened on the various occasions between January 23, 1949 and February 18, 1949, and between March 10, 1949 and April 2, 1949, when rates of flow of 35 m.g.d. or more for cleaning the 60-inch Bloomfield Avenue line were superimposed on City drafts with the 60-inch out of service to the City. The cone valves also opened at times of peak rates of draft during days of excessive consumption during June, and on December 9, 1949 due to a break in a 24-inch line. Means of recording the times of openings and closings were studied but not procured.

WANAQUE WATER: There was no interruption to the delivery of Wanaque water into downtown Newark during the year. Setting of about 5 pounds on the low side of the regulators at Belleville Reservoir was maintained from the beginning of the year, throughout the summer, and until mid October, when it was cut to the lowest possible level of 2 pounds or 3 pounds to conserve water.

Wanaque water was used, by-passing Belleville Reservoir, from July 18, 1949 to September 23, 1949 instead of the customary procedure of using Pequannock water through the reservoir. The reservoir was emptied and cleaned during this period.

On October 14, 1949 the City of Newark was advised by the North Jersey District Water Supply Commission that the City of Elizabeth had filed application with the Commission for the development of the proposed Ramapo River addition to the Wanaque System, and set October 26, 1949 as the date for Wanaque partners to meet with the Commission to discuss procedure. On that date the 25 m.g.d. addition to the Wanaque yield by the pumping of flood waters of the Ramapo River at Pompton

Lake Dam into the Wanaque Reservoir was again briefly outlined. The North Jersey District Water Supply Commission advised that it had received requests from the City of Elizabeth, the City of Bayonne, and the Town of Irvington for estimates of cost of participation in the Ramapo additional supply to the extent of 12 m.g.d., 15 m.g.d. and 4 m.g.d. respectively, and was now in a position to apply again to the Division of Water Policy and Supply of the Department of Conservation and Economic Development of the State of New Jersey for the right to divert water from the Ramapo River for potable purposes. The North Jersey District Water Supply Commission also invited others to contribute toward a fund of $5,000.00, which with $20,000,00 provided by the Federal Government would cover the cost of studies of the Ramapo development, and estimates of costs of ownership therein by Elizabeth, Irvington and others if interested. Newark indicated its interest and by resolution 1102, of November 28, 1949, requested a 5 m.g.d. participation, and joined in asking the North Jersey District Water Supply Commission to obtain the consent of the Division of Water Policy and Supply to the diversion of the flood waters of the Ramapo. Hearing before the Division of Water Policy and Supply was set for January 9, 1950 in Trenton.

No water from Pequannock, during 1949, was delivered into the Wanaque System through existing interconnection provided at Wayne for the interchange of waters. Wanaque Reservoir was depleted to a record low of elevation 266.91 (9 billion gallons) on December 26, 1949 due to below normal rainfall since June and draft from the reservoir in excess of safe yield. The protracted drought definitely established the fact that the safe yield of the Wanaque Supply is not over 85 m.g.d. - not 100 m.g.d. as usually stated but long doubted. Pequannock Reservoirs also were depleted excessively and there were no overflows at Macopin which could be diverted through the Pequannock lines into the Wanaque Aqueduct.

EXCESS DIVERSION: Excess diversion charges for water used by the City of Newark from Pequannock Watershed for the year 1948 were billed to the City in February, 1949 at the rate of $2.50 per million gallons, making a total charge for 9288.687 million gallons of excess diversion $23,221.72. The rate could have been considerably in excess of this, but the $2.50 per million gallons charge is a limit previously agreed upon.

HYDRANT SPRINKLERS: Permits to use fire hydrants with sprinkler shower attachment for street bathing were again issued in 1949, beginning June 22, and a total of 68 permits were finally outstanding at the end of August. All were rescinded with the opening of schools early in September. Unauthorized use of hydrants without sprinkler attachments continued as in previous years and seriously affected pressures and quality of water in certain areas, causing innumerable complaints and much annoyance to citizens.

WATER CONSERVATION ACCOUNT OF DROUGHT: The City of Newark, together with other municipalities in Northern New Jersey, as well as New York City, became very water conscious late in 1949 due to below normal rainfall since early summer and rates of draft on the Wanaque System in excess of the safe dependable yield. On October 20, 1949 a conference of operators of the larger supplies in North Jersey met in Newark with engineers of the Division of Water Policy and Supply of the State of New Jersey, discussed the seriousness of the situation unless abundant rains came. A second conference was held on

November 15, 1949 as a result of continuing rainfall deficiency and increasing seriousness of the situation. Wide publicity, via newspapers and radio, was given to the need of conserving water to prevent the possibility of rationing water during the summer of 1950. Various steps were taken in Newark to save water, such as cutting pressures in regulated areas; keeping Cedar Grove Reservoir drawn down to a safe limit as determined by reservoir structures; reducing flushings for dirty water complaints to a minimum; eliminating use of water for street cleaning; notifying large users to eliminate wastage; inaugurating special programs of investigations of leaks indicated by high meter readings and of possible leaks at hydrants; prohibition of use of water for car washing on Monday, Tuesday, Wednesday and Thursday of each week.

As steps to utilize existing storage and future stream flow to the fullest extent possible, plans were made to provide a channel in Echo Lake Reservoir to make available all of that storage which is now unavailable due to the non-completion of such a channel when the level of Echo Lake was raised and a new dam built in 1927-1928; Charlotteburg Pond and Macopin Intake, on the watershed, and Cedar Grove Reservoir were held as low as possible consistent with good operating conditions to prevent or reduce to a minimum the loss of water by overflow at Macopin; and to this end also arrangements were made for the North Jersey District Water Supply Commission to stand ready to take water into the Wanaque aqueduct from the Pequannock pipe lines, at the interconnection at Wayne, and for P. Ballantine & Sons to put water into the ground in their well field in Newark should overflow at Macopin occur in spite of other efforts.

Immediate construction of the Ramapo addition to the Wanaque Supply was recommended and urged. The City of Newark, by resolution on November 28, 1949, requested the North Jersey District Water Supply Commission to prepare a preliminary estimate of the cost to the City of Newark of a 5 m.g.d. participation in the proposed Ramapo River addition to the Wanaque Project, and to file application with the Division of Water Policy and Supply of the Department of Conservation and Economic Development of the State of New Jersey for permission to divert flood waters of the Ramapo River at Pompton Lakes, New Jersey for such additional permanent water supply. Hearing on the application was set for January 9, 1950 in Trenton.

An ordinance authorizing the declaration of an emergency whenever the storage capacity of Newark's water supply reservoirs falls below 50 per cent of full storage, and during such emergency providing regulations governing the use of water to prevent waste and penalties for violations, was prepared in December, 1949 (passed January 11, 1950).

PITOMETER TESTS, SURVEYS AND LEAK DETECTION: Testing of large meters in place by pitometer or by comparison with 2-inch standard test meter continued throughout 1949, except as interrupted by other special pitometer work, and 126 large meters were so tested. Venturi and other type large meters on 14 of the connections supplying water to other municipalities were included in these. The special work included 76 - 24-hour measurements of flow, by pitometer, in main feeders of the distribution system, with 76 corresponding 24-hour records of pressures.

On leak location work other than at hydrants, a total of 835 leak

investigations were made and 4 depressions were investigated. As a result, 486 service leaks were located, 309 on the house side of the curb box and 177 on the street side; and 4 leaks in transmission mains and 29 leaks in distribution mains were discovered. Underground structures to the number of 289 were located, of which 248 were service pipes, 12 were distribution mains, 3 were transmission mains, and 26 were valves. On routine surveys for leaks by soundings at 3203 hydrants, 238 were found wasting and 77 were found leaking otherwise. This hydrant leak work was double that of 1948, and was intensified in the latter part of 1949 when special water conservation steps were inaugurated.

PEQUANNOCK WATERSHED PROPERTY

Revision and extension of records of property holdings of the City of Newark on the Pequannock Watershed, and of other Division of Water properties, continued during the year. Considerable checking of property lines, and possible encroachments, was occasioned by the construction of new buildings on properties adjacent to City owned land. One such was a field survey made on July 20, 1949 of the Vreeland and Talmadge properties on Jennings Road, near Route 23, in the Oak Ridge Reservoir section of the watershed.

Taxes on all City owned property, pertaining to the Division of Water, were checked and approved for payment by the Division of Water, except where appeals against unreasonable assessments were filed. Assessment levied by the Township of West Milford for 1949 was appealed to the Passaic County Board of Taxation, and hearing was attended on September 15, 1949. Judgment was reserved. Appeal to the State Board of Taxation from the assessment of $1,483,840.00 levied by the Township of West Milford for 1948 was heard on September 19, 1949 but adjourned on account of illness of the defense attorney until October 10, 1949. On that day presentation of the City's case was started but not completed, and hearing was adjourned to a date to be set later.

MISCELLANEOUS

BALLANTINE BREWERY WELL RECHARGE EXPERIMENT, inaugurated in 1948, was resumed on February 11, 1949 when overflow and wastage of Pequannock water started at Macopin Intake. Delivery of water into the wells from the Newark High Pressure Fire System was limited to night times when pressures were needlessly high. A conference of Federal, State, City and Ballantine representatives discussed the merits of this recharge program on March 16, 1949 and concluded that it should be expanded for greater effectiveness. Overflow at Macopin ceased on June 1, 1949 and the recharge program was ended. An average of 2 m.g.d. of recharge water was supplied to five wells for a period of 109 days, a total of about 200 million gallons.

WATER SUPPLY TO THE VILLAGE OF SOUTH ORANGE FROM NEWARK was under consideration at the end of 1948. By letter of March 21, 1949, the Village advised Newark that it was not in a position to take water from Newark unless Newark would consider a price of $40.00 per million gallons. In view of prices to others for Newark water being $85.00 per million gallons or more, and other considerations, negotiations were terminated and the Village proceeded to expand its present well supply and to strengthen its distribution system.

Tiernan master visible vacuum chlorinator, Type MMSV-M, chlorinator capacity 100 pounds, replaced a Type MSV machine of same capacity.

COMMERCIAL DIVISION OF THE DIVISION OF WATER was transferred from the Department of Public Works to the Department of Revenue and Finance with the inauguration of the new City Commission in May, 1949.

TENTATIVE BUDGET FOR THE DIVISION OF WATER for the year 1949 was submitted in January, 1949. Budget was approved March 9, 1949. The City of Newark General Budget again appropriated $650,000.00 of water revenue surplus toward the reduction of the tax rate. Preparation of 1950 budget was started in December, 1949.

Inventory of all supplies and equipment of the Division of Water, as of December 31, 1948, was completed and submitted early in 1949, and inventory as of December 31, 1949 was being prepared at the end of the year.

Statistics were compiled as to rainfall, run-off, consumption, cost of water, yield, storage, water quality and physical characteristics, and other operating data.